

What is claimed is:

1. A dielectric device comprising:

first and second impurity regions formed with  
predetermined spacing on a semiconductor;

5 a gate insulating film formed on a region between said  
first and second impurity regions;

a gate electrode formed on said gate insulating film;

an interlayer insulating film formed on said  
semiconductor so as to cover said gate electrode and said gate  
10 insulating film and having a contact hole;

a lower electrode layer formed in said contact hole of  
said interlayer insulating film and electrically connected  
to said gate electrode;

a dielectric film formed on said interlayer insulating  
15 film so as to be brought into contact with the upper surface  
of said lower electrode layer; and

an upper electrode layer formed on said dielectric film,  
said lower electrode layer and said upper electrode  
layer being composed of a conductive oxide having a  
20 perovskite structure,

said dielectric film being composed of dielectrics  
having a perovskite structure.

2. The dielectric device according to claim 1, further  
25 comprising

a connecting layer formed under said lower electrode layer in said contact hole for electrically connecting said lower electrode layer to said gate electrode.

5        3. The dielectric device according to claim 1, wherein  
said upper electrode layer and said lower electrode  
layer are composed of a layered structure conductive oxide,  
and

10        said dielectric film is composed of layered structure  
dielectrics.

4. The dielectric device according to claim 1, wherein  
said upper electrode layer and said lower electrode  
layer are composed of a bismuth based system layered  
15 structure conductive oxide, and

      said dielectric film is composed of layered structure  
dielectrics containing bismuth.

5. The dielectric device according to claim 1, wherein  
20        said dielectric film is composed of ferroelectrics.

6. The dielectric device according to claim 1, wherein  
said upper electrode layer and said lower electrode  
layer are composed of a layered structure conductive oxide  
25 containing bismuth, strontium, copper and oxygen, and

said dielectric film is composed of layered structure ferroelectrics containing strontium, bismuth, tantalum and oxygen.

5           7. The dielectric device according to claim 2, further comprising

a diffusion barrier layer provided between said connecting layer and said lower electrode layer.

10           8. The dielectric device according to claim 7, further comprising

a platinum layer provided between said diffusion barrier layer and said lower electrode layer.

15           9. A dielectric device comprising:

a dielectric film composed of layered structure dielectric containing bismuth; and

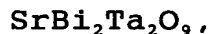
a first electrode layer laminated on one surface of said dielectric film and composed of a bismuth based system  
20 layered structure conductive oxide.

10. A dielectric device comprising:

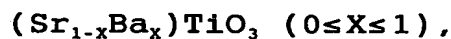
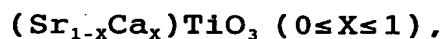
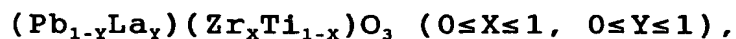
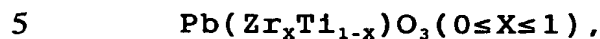
a dielectric film; and

a first electrode layer laminated on one surface of said  
25 dielectric film,

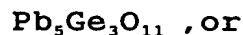
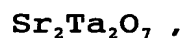
said dielectric film being composed of



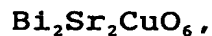
$(\text{Bi}_2\text{O}_2)^{2+}(\text{A}_{n-1}\text{B}_n\text{O}_{3n+1})^{2-}$ , where A is Sr, Ca, Ba, Pb, Bi, K or Na, and B is Ti, Ta, Nb, W or V,



$(\text{Sr}_{1-x-y}\text{Ba}_x\text{M}_y)\text{Ti}_{1-z}\text{N}_z\text{O}_3$ , where M is La, Bi, Sb or Y, and N  
10 is Nb, V, Ta, Mo or W,  $0 \leq x \leq 1$ ,  $y = 1 - x$ ,  $0 \leq z \leq 1$ ,



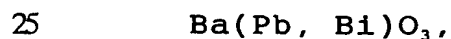
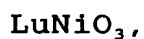
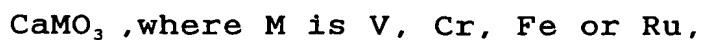
15 said first electrode layer being composed of



$\text{A}_2\text{B}_2\text{C}_n\text{M}_{n+1}\text{O}_{2n+6}$ , where  $n = 0, 1, 2, 3, 4, 5$ , A is Tl, Bi, Mg or Cu, B is Ba, C is Ca, and M is Cu,

$(\text{Sr}, \text{La})\text{MO}_3$ , where M is Ti, V, Cr, Mn, Fe, Co, Ni, Cu,  
20 Ru or Ir,

$(\text{Sr}, \text{La})_2\text{MO}_4$ , where M is Ti, V, Cr, Mn, Fe, Co, Ni, Cu,  
Ru or Ir,



$\text{LnBa}_2\text{Cu}_n\text{O}_{n+4-a}$ , where  $n = 3, 4$ , Ln is Y, La, Pr, Nd, Sm,

Eu, Gd, Td, Dy, Ho, Er, Tm, Yb or Lu,

$(\text{Ba}, \text{A})\text{BiO}_3$ , where A is K or Rb,

$\text{Sr}_{1+n}\text{Cu}_n\text{O}_{2n+1}$ , where  $n = 1, 2, 3, \infty$ ,

5  $\text{ReO}_3$ , or

$\text{M}_x\text{WO}_3$ , where M is H, an alkali metal, an alkaline earth metal, Cu, Ag, In, Tl, Sn or Pb.

11. The dielectric device according to claim 9, further  
10 comprising

first and second impurity regions formed with  
predetermined spacing on a semiconductor,

said dielectric film being formed on a region between  
said first and second impurity regions.

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12. The dielectric device according to claim 9, further  
comprising

first and second impurity regions formed with  
predetermined spacing on a semiconductor, and

20 a gate insulating film formed on a region between said  
first and second impurity regions,

said dielectric film being formed on said gate  
insulating film.

25 13. The dielectric device according to claim 9, further

comprising

a second electrode layer laminated on the other surface of said dielectric film,

said second electrode layer having a crystalline  
5 structure similar to that of said dielectric film.

14. The dielectric device according to claim 13,  
wherein

said second electrode layer is composed of a bismuth  
10 based system conductive layered structure oxide.

15. The dielectric device according to claim 13,  
wherein

said second electrode layer is composed of  
15  $\text{Bi}_2\text{Sr}_2\text{CuO}_6$ ,

$\text{A}_2\text{B}_2\text{C}_n\text{M}_{n+1}\text{O}_{2n+6}$ , where  $n = 0, 1, 2, 3, 4, 5$ , A is Tl, Bi,  
Mg or Cu, B is Ba, C is Ca, and M is Cu,

$(\text{Sr}, \text{La})\text{MO}_3$ , where M is Ti, V, Cr, Mn, Fe, Co, Ni, Cu,  
Ru or Ir,

20  $(\text{Sr}, \text{La})_2\text{MO}_4$ , where M is Ti, V, Cr, Mn, Fe, Co, Ni, Cu,  
Ru or Ir,

$\text{CaMO}_3$ , where M is V, Cr, Fe or Ru,

$\text{LuNiO}_3$ ,

$\text{Ba}(\text{Pb}, \text{Bi})\text{O}_3$ ,

25  $\text{LnBa}_2\text{Cu}_n\text{O}_{n+4-a}$ , where  $n = 3, 4$ , Ln is Y, La, Pr, Nd, Sm,

Eu, Gd, Td, Dy, Ho, Er, Tm, Yb or Lu,

(Ba, A)BiO<sub>3</sub>, where A is K or Rb,

Sr<sub>1+n</sub>Cu<sub>n</sub>O<sub>2n+1</sub>, where n = 1, 2, 3, ∞)

ReO<sub>3</sub>, or

- 5 M<sub>x</sub>WO<sub>3</sub>, where M is H, an alkali metal, an alkaline earth metal, Cu, Ag, In, Tl, Sn or Pb.

16. The dielectric device according to claim 10, further comprising

- 10 a second electrode layer laminated on the other surface of said dielectric film,

said second electrode layer being composed of

Bi<sub>2</sub>Sr<sub>2</sub>CuO<sub>6</sub>,

- A<sub>2</sub>B<sub>2</sub>C<sub>n</sub>M<sub>n+1</sub>O<sub>2n+6</sub>, where n = 0, 1, 2, 3, 4, 5, A is Tl, Bi,  
15 Mg or Cu, B is Ba, C is Ca, and M is Cu,

(Sr, La)MO<sub>3</sub>, where M is Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Ru or Ir,

(Sr, La)<sub>2</sub>MO<sub>4</sub>, where M is Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Ru or Ir,

- 20 CaMO<sub>3</sub>, where M is V, Cr, Fe or Ru,

LuNiO<sub>3</sub>,

Ba(Pb, Bi)O<sub>3</sub>,

LnBa<sub>2</sub>Cu<sub>n</sub>O<sub>n+4-a</sub>, where n = 3, 4, Ln is Y, La, Pr, Nd, Sm,

Eu, Gd, Td, Dy, Ho, Er, Tm, Yb or Lu,

- 25 (Ba, A)BiO<sub>3</sub>, where A is K or Rb,

$\text{Sr}_{1+n}\text{Cu}_n\text{O}_{2n+1}$ , where  $n = 1, 2, 3, \infty$ ,

$\text{ReO}_3$ , or

$\text{M}_x\text{WO}_3$ , where M is H, an alkali metal, an alkaline earth metal, Cu, Ag, In, Tl, Sn or Pb.

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17. The dielectric device according to claim 13, further comprising

first and second impurity regions formed with predetermined spacing on a semiconductor, and

10 a gate insulating film formed on a region between said first and second impurity regions,

said second electrode layer being formed on said gate insulating film.